

IV. REMARKS

Claims 7 and 15 have been amended to refer to the generic names of the materials sold under the trademarks TEFLON[®], ULTEM[®] and ULTEM 2300[®].

A clean and marked-up copy of a substitute specification, including the abstract, is provided in which spelling, typographical, punctuation, grammatical and obvious error corrections have been made.

Reference to non-existent Fig. 6 has been deleted from the brief discription of the drawings.

Original Table 1 has been deleted and the information provided therein has been incorporated as text and inserted at the same location as the original table (i.e. page 12 / line 15 of the as-filed specification; page 12 / line 8 of the enclosed substitute specification). Table 2 has been renamed as Table 1 due to the deletion of original Table 1.

The trademarks cited in specification have been capitalized and noted with appropriate markings. The generic material names have been provided for PTFE, TEFLON[®], PFA, TEFLON[®] PFA, ULTEM[®] and ULTEM 2300[®]. Manufacturer's data sheets are enclosed which list the generic names for the trademarked materials. The Applicant submits that the generic names for the trademarked materials are well-know in the art and readily accessible to the skilled artisan.

Informal drawings Fig. 1 and Fig. 4 have been amended and replacement drawing sheets are provided. In Fig. 1, extraneous reference numbers, markings, page number, and figure labels have been removed and replacement figure labels have been provided for Fig. 1A and Fig. 1B. Replacement reference numbers have been provided for Fig. 1B which match the reference numbers provided in the specification. In Fig. 4, the three views shown have been relabeled as Fig. 4A, Fig. 4B and Fig. 4C. Extraneous figure labels, text and page number have been removed. Reference numbers for the top plate and bottom plate have been added in Fig. 4B and Fig. 4C..

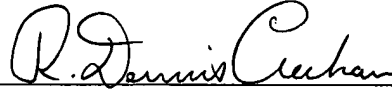
The Applicant submits that no new matter has been added to the specification, abstract or drawings.

Summary

The Applicant respectfully requests entry of the above Amendments and consideration of the above Remarks. The Applicant submits that all claims are in condition for allowance and requests early favorable action by the Examiner.

Respectfully submitted,

Date 12/3/03

A handwritten signature in cursive script, reading "R. Dennis Creehan", written over a horizontal line.

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Teflon® PTFE Fluoropolymer Resin Granular Molding Powders



General

Teflon® PTFE (polytetrafluoroethylene) granular molding powders are ideal for molding many different products and stock shapes, such as rods, tubes, and sheets. Products fabricated from Teflon® PTFE stock shapes are unaffected by nearly all chemicals and feature superior electrical properties. These products, some of which are rated for continuous service at 260°C (500°F), also provide exceptional low-temperature toughness, plus unique adhesion and flame resistance.




Processing







Teflon® PTFE granular molding powders are processed by preparing a preform, sintering the preform, and then fabricating functioning machined parts from the sintered stock shape. Filled compounds are easily produced from DuPont PTFE granular powders by mixing 5% to 60%, by weight, of inorganic fillers that selectively enhance properties.

Preforming: Adequate preform pressures are required to maximize end-use performance. Typical pressures range from 3,000 to 4,500 psi with dwell times varying with preform size. Stock shapes preformed at lower pressures exhibit inferior physical properties (specific density, tensile strength, elongation, flex life), electrical properties, and permeation and chemical resistance.

Sintering: Adequate sintering requires a programmable oven. The temperature is slowly raised from room temperature to 363° to 382°C (685° to 720°F). Hold times at these temperatures vary with part geometry and dimensions. The oven temperature is then slowly lowered to room temperature. Stock shapes that are not properly sintered exhibit inferior physical properties (specific density, tensile strength, elongation, flex life), electrical properties, and permeation and chemical resistance.

Note: Teflon® PTFE fluoropolymer resin technical information sheets are available as Adobe® Acrobat® PDF files, as indicated by the icon. If you do not have Adobe Acrobat reader on your computer, you may download it free from their web site.

Teflon® PTFE Grade	Fine Cut Resins	Applications
7A 	Finely divided 35-micron particles. 460-g/L bulk density. Up to 5,500 psi in tensile strength. Maximum granular PTFE chemical resistance. Parts fabricated from this resin have excellent physical and electrical properties.	<ul style="list-style-type: none"> • High-performance mechanical and electrical applications requiring excellent end use performance
7B 	Ultra-fine 24-micron particles. 330-g/L bulk density. Up to 5,300 psi in tensile strength. Maximum granular PTFE chemical resistance. Parts fabricated from this resin have excellent physical and electrical properties.	<ul style="list-style-type: none"> • Skived film and sheet • Gaskets • Bridge or pipeline bearing pads • Piston rings • Diaphragms
7C 	Finely divided "fluffy" 20-micron particles. 250-g/L bulk. Up to 5,900 psi in tensile strength. Often used in applications requiring excellent flex	<ul style="list-style-type: none"> • Expansion joints

	life. Parts fabricated from this resin have excellent physical and electrical properties.	<ul style="list-style-type: none"> • Bellows • Piston rings • Diaphragms • Skived film and sheet
6543 	Fine-cut resin designed for compression molding of blocks and sheets. For use as a base resin for compounds. Exhibits minimal sagging in billets as large as 350 kg (800 lb).	<ul style="list-style-type: none"> • Seal rings • Valve seats • Bearing pads • Linings
Teflon® PTFE Grade	Pelletized Resins	Applications
8 	Pelletized 640-micron particles. 730-g/L bulk density. Up to 4,400 psi in tensile strength. Resin particles have hard surfaces and require higher preform pressures. Parts fabricated from this resin have superior physical and electrical properties.	<ul style="list-style-type: none"> • Ball valve seats, seals, and discs • Labware • Small Parts
8A 	Pelletized 510-micron particles. 690-g/L bulk density. Up to 4,480 psi in tensile strength. Resin particles are preformed using lower preform pressures. Parts fabricated from this resin have superior physical and electrical properties.	<ul style="list-style-type: none"> • Isostatic molding • Skived sheet • Tank and pipe linings • Ducting and expansion joints
8B 	Free-flowing white powder composed of relatively large particles. 705-g/L bulk density. Up to 4,000 psi in tensile strength. Particles are designed to provide the highest quality of surface smoothness on finished part, while maintaining outstanding flow and moldability. Parts fabricated from this resin have superior physical and electrical properties.	<ul style="list-style-type: none"> • Ball valve seats, seals, and discs • Labware • Small Parts • Lining pipes, valves, and valve plugs • Ducting, expansion bellows, piston rings, and other large complex moldings
850A 	Ultrahigh-bulk-density pelletized 450-micron particles. 950-g/L bulk density. Up to 3,700 psi in tensile strength. Parts fabricated from this resin have superior physical and electrical properties. Bulk density and particle size are very uniform making this free-flowing resin excellent for high-speed automatic molding applications.	<ul style="list-style-type: none"> • Automatic molding • Tank, pipe and valve lining
Teflon® PTFE Grade	Presintered Resins	Applications
9B 	Hard free-flowing pelletized 650-micron particles. 590-g/L bulk density. Up to 4,500 psi in tensile strength. Parts fabricated from this resin have superior physical and electrical properties. Bulk density and particle size are very uniform, making this free-flowing resin excellent for high-speed automatic molding	<ul style="list-style-type: none"> • Rod • Tubing • Profiles



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Teflon® PFA Fluoropolymer Resin



General

Teflon® PFA is a perfluoroalkoxy copolymer resin available in pellet or powder. Teflon® PFA combines the processing ease of conventional thermoplastic resins with the excellent properties of Teflon® polytetrafluoroethylene (PTFE). Products manufactured from Teflon® PFA can offer continuous service temperatures up to 260°C (500°F). What's more, Teflon® PFA provides superior creep resistance at high temperatures, excellent low-temperature toughness, and exceptional flame resistance.









New! Teflon® PFA HP Plus Now Available for High-Performance Adhered Linings for Equipment and Pipe

Processing

Teflon® PFA fluoropolymer resins are processed by conventional melt-extrusion techniques and by injection, compression, rotational, transfer, and blow-molding processes. The high melt strength and heat stability of these resins permit the use of relatively large die openings and high-temperature draw-down techniques, which increase processing rates. Reciprocating screw injection molding machines are recommended. Corrosion-resistant metals should be used in contact with the molten resin. Long extruder barrels, relative to diameter, are used to provide residence time for heating the resin to 316° to 427°C (600° to 800°F).

Note: Teflon® PTFE fluoropolymer resin technical information sheets are available as Adobe® Acrobat® PDF files, as indicated by the icon. If you do not have Adobe Acrobat reader on your computer, you may download it free from their web site.

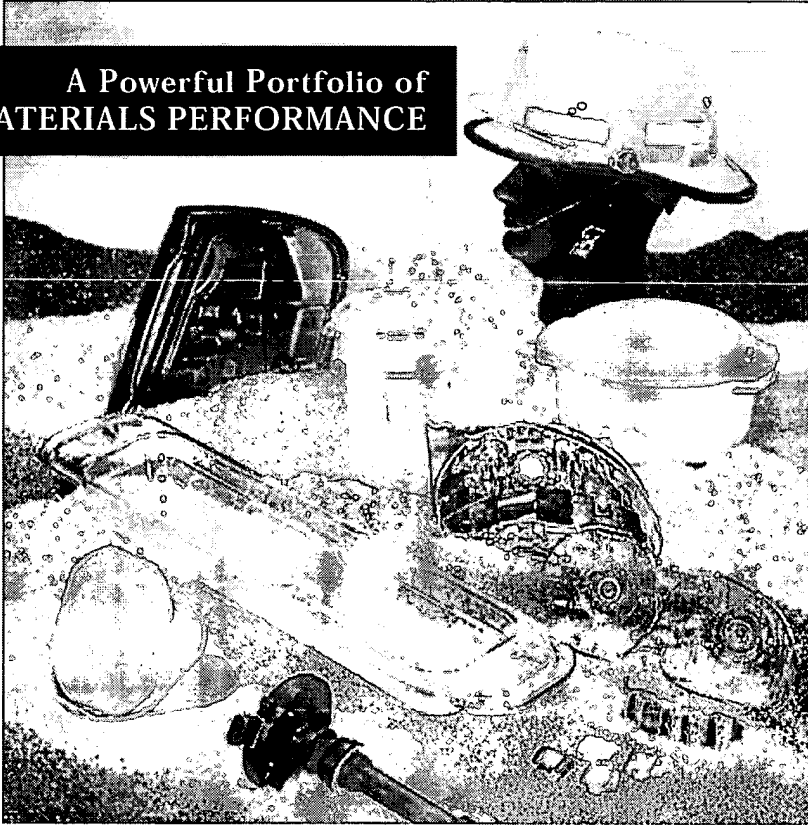
Teflon® PFA Grade	General Purpose	Applications
340 	Extrusion and injection molding resin. Highest flow rate. Lowest molecular weight.	<ul style="list-style-type: none"> • Tubing • Injection or blow-molded articles • Chemical linings (tanks, pipes, valves, pumps)
345 	Extrusion and injection molding resin. Intermediate flow rate with higher stress crack resistance than 340.	<ul style="list-style-type: none"> • Tubing • Injection- or blow-molded articles • Chemical linings
350 	High molecular weight resin with highest resistance to stress cracking. Lowest flow rate of this series of resins for extrusion and transfer molding.	<ul style="list-style-type: none"> • Films • Chemical tank linings • Molded articles • Tubing
Teflon® PFA Grade	Ultrahigh Purity	Applications
440 HP 	Premium resin with the lowest level of extractables designed to meet ultrahigh purity requirements. Highest flow rate for injection molding and extrusion processes. FDA food contact compliance. Highest level of inertness due to stable end group polymer structure.	<ul style="list-style-type: none"> • Fluid handling components for critical, high-purity processes like semiconductor, pharmaceutical, and biotechnology

445 HP 	Premium resin designed to meet ultrahigh purity requirements with enhanced resistance to stress cracking. For extrusion, injection, and transfer molding. FDA food contact compliance.	<ul style="list-style-type: none"> Fluid handling components for critical, high-purity processes like semiconductor, pharmaceutical, and biotechnology
450 HP 	Premium high molecular weight resin designed to meet ultrahigh purity requirements. Highest level of stress crack resistance. For extrusion and transfer molding processes. FDA food contact compliance.	<ul style="list-style-type: none"> Fluid handling components for critical, high-purity processes like semiconductor, pharmaceutical, and biotechnology
940 HP Plus 	Special-purpose resin with the exceptional purity of PFA 440 HP, with improved flex life and chemical stress crack resistance.	<ul style="list-style-type: none"> Applications requiring low extractable fluorides and freedom from other foreign materials Molded parts Tubing
950 HP Plus 	Special-purpose resin with exceptional purity. Similar to PFA 450 HP, with improved flex life and chemical stress crack resistance.	<ul style="list-style-type: none"> Applications requiring low extractable fluorides and freedom from other foreign materials.
RM1 HP Plus 	Premium rotomolding resin that will provide superior processability, products, and smooth surface. Teflon® RM1 HP Plus is chemically modified to provide enhanced resin purity, lower extractable fluorides, and freedom from other foreign materials.	<ul style="list-style-type: none"> Pump housings, vessels, columns, and fittings with unusual shape High-purity chemically resistant containers
TE-7216 TE-7217 	Premium rotolining resins. Teflon® PFA TE-7216 forms a rotolined stable sub-layer adhered to the underlying substrate. Teflon® PFA TE-7217 is specially chosen for the rotolined top layer; through a unique and proprietary system it provides superior processing, a rotolining thickness with no internal layer boundary, and a superior enduse synergy with the under-layer of Teflon® PFA TE-7216.	<ul style="list-style-type: none"> Vessels, columns, elbows, tees, and pipe sections with complex shapes, and various housings Hollow structures with internal contours that permits uniform and smooth flow
Teflon® PFA Grade	Special Purpose	Applications
C 	Special-purpose compounded resin to provide static dissipation. Several viscosity grades available for a variety of molding processes.	<ul style="list-style-type: none"> Applications requiring static dissipation along with thermal or chemical resistance
335A 	Aqueous dispersion containing 60%, by weight, Teflon® PFA particles.	<ul style="list-style-type: none"> High-temperature, chemical-resistant coatings



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ULTEEM[®]

Products and Markets



About Our ULTEM® Resin Product Family

ULTEM resin, GE Plastics' premier performance amorphous polymer product family, has long been known for its outstanding high-heat resistance. However, this high-performance amorphous resin is also characterized by broad chemical resistance, inherent flame retardance, dimensional stability, high modulus, strength, clarity and processability. As a result, many manufacturers and molders are discovering ULTEM resin's good fit in a variety of markets and applications previously unexplored.

The ULTEM resin product family is composed of base polymers, blends, and reinforced resin grades.

ULTEM® 1000 resin, the base polymer, is a transparent amber color. It offers long-term heat resistance and inherent flame retardancy with

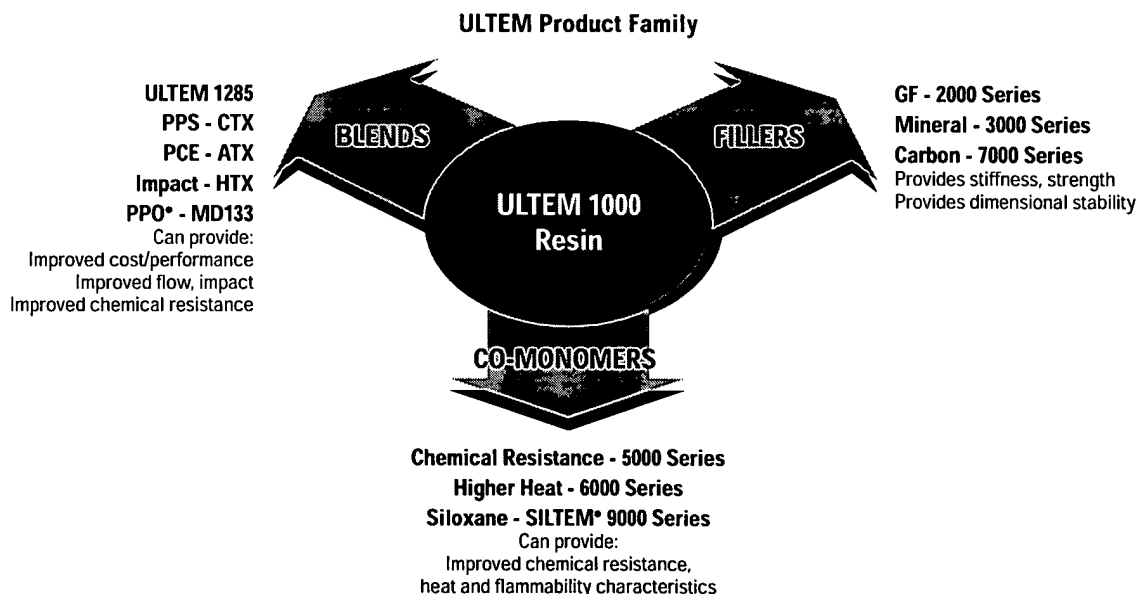
low smoke evolution. And it can maintain its strength and impact resistance at elevated temperatures. Other key properties include: good resistance to a broad range of chemicals, including automotive fluids, hydrocarbons and alcohols; stable dielectric constant and dissipation over a wide range of temperatures; transparency to visible and infrared light and microwaves; very good dimensional stability, compliance with FDA, EU, national food contact regulations and USP Class VI; and very good processability on conventional molding equipment.

A new blend platform provides transparency and good flow, coupled with intermediate heat performance and price. Slightly lighter in yellowness index than standard ULTEM 1000, ULTEM 1285 is also available in transparent tints. They offer better gloss and part appearance than the opaque ULTEM blends due to the compatibility of

the base resins. Fully FDA compliant, ULTEM 1285 is targeted at food service, housewares, medical and automotive applications.

For applications that demand exceptionally high performance, ULTEM resin's base polymer can be modified with fillers such as glass (the 2000 series), minerals (the 3000 series) and carbon (the 7000 series). The fillers provide added strength or stiffness and improve the dimensional stability of the ULTEM resin base. The 4000 series' unique combination of fillers provides excellent wear-resistance.

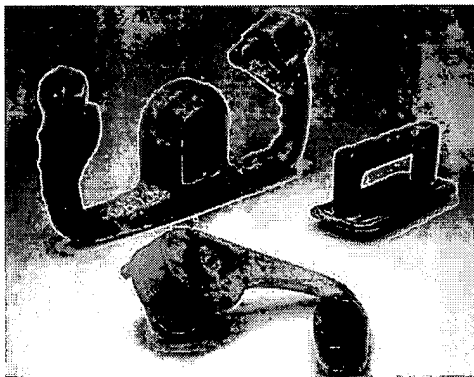
ULTEM resin's base polymer can also be modified with co-monomers to produce the chemically resistant 5000 series, the heat-resistant 6000 series, and the SILTEM® 9000 resin series, which is characterized by improved flame retardancy.



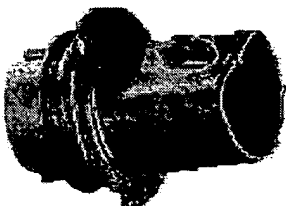
The ULTEM Resin Product Family: Reinforced Resin Grades



By adding a variety of fillers, the ULTEM resin base polymer can be blended to meet a wide range of specifications.



Manufacturers of many mission critical parts, such as these aircraft steering components, have specified ULTEM reinforced resins due to their rigidity and dimensional stability.



Featuring low coefficient of friction, good heat resistance and dimensional stability, reinforced ULTEM resins are used in many automotive applications, such as this light bulb socket.



GE Plastics offers a number of ULTEM resin grades in which the base polymer (ULTEM 1000) is modified/reinforced with fillers such as glass, minerals, and/or carbon to meet stringent specifications for modulus, warpage, low coefficient of friction, and wear resistance.

The 2000 series

The ULTEM 2000 series resins are 10 percent to 40 percent glass-reinforced grades which complement the properties of ULTEM 1000 series resins by providing even greater rigidity, improved dimensional

stability and creep resistance. They include the 2100 (10 percent glass reinforced), which offers good processability; 2110 (10 percent glass reinforced), based on a low viscosity PEI resin; 2200 (20 percent glass reinforced), offering high rigidity and dimensional stability as well as very good processability; 2210 (20 percent glass reinforced), which features low viscosity; 2300 (30 percent glass reinforced), which features higher rigidity and dimensional stability as well as excellent processability; 2310 (30 percent glass reinforced), which features low viscosity; 2400 (40 percent glass reinforced), which is characterized by high stiffness and dimensional stability; and 2410 (40 percent glass reinforced), which features low viscosity.

The 3000 series

Also in the ULTEM 3000 series resins series are glass-reinforced low warpage resin grades. They incorporate short glass fibers and/or mineral fillers to help attain a balanced property profile that features low warpage, dimensional stability, and low coefficients of thermal expansion.

